

Support information

A route to understand the ethane adsorption selectivity of zeo-litic imidazolate framework-8 in ethane-ethylene mixtures

Jaquebet Vargas-Bustamante, Roberto Salcedo and Jorge Balmaseda

Departamento de polímeros, Instituto de Investigaciones en Materiales, Universidad Nacional Autónoma de México.
Circuito exterior s/n. Ciudad Universitaria. Coyoacán 04510.
Ciudad de México. México.

S.1 Zero length column chromatography

For all ZLC experiments, the long-term response model was applied, and the average residual error function (ARE) was used. This function is defined as:

$$ARE = \frac{100}{S} \sum_{K=1}^S \left| \frac{(C/C_0)_{\text{calculated}} - (C/C_0)_{\text{experimental}}}{(C/C_0)_{\text{calculated}}} \right| \quad (\text{S } 1)$$

donde S, es el número de puntos experimentales

$$SOR = \frac{100}{S} \sum_{K=1}^S (q_{\text{experimental}} - q^*_{\text{calculated}})^2 \quad (\text{S } 2)$$

Best-fit parameters for the isotherms were found by minimizing the squared objective function of the residuals (SOR).

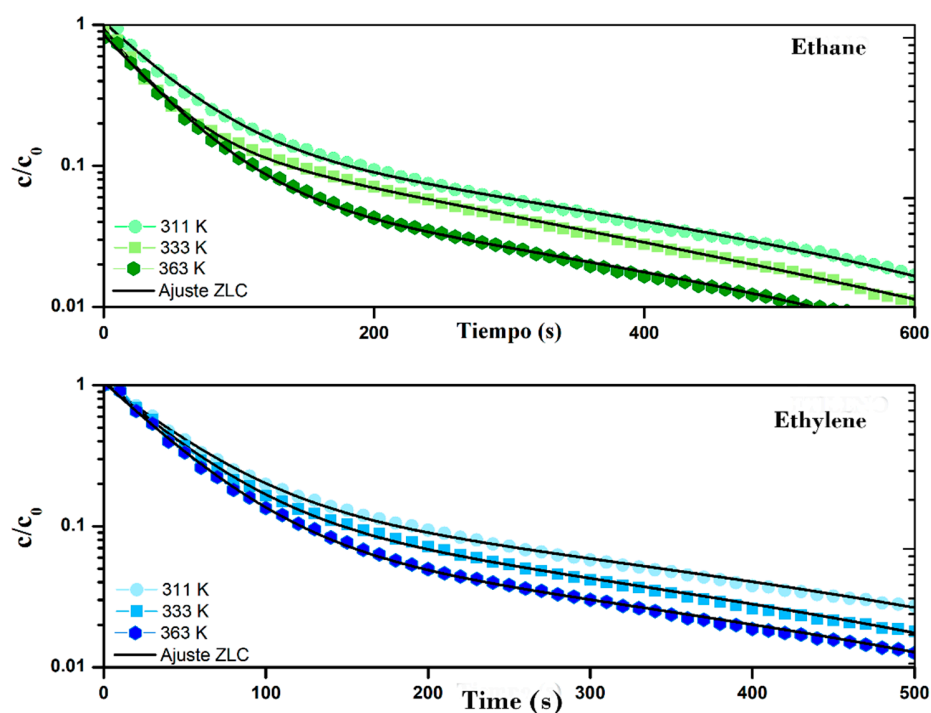


Figure S 1. ZLC curves for ethane and ethylene in a ZIF-8 sample at various temperatures, with a constant purge flow rate of 10 mL/min.

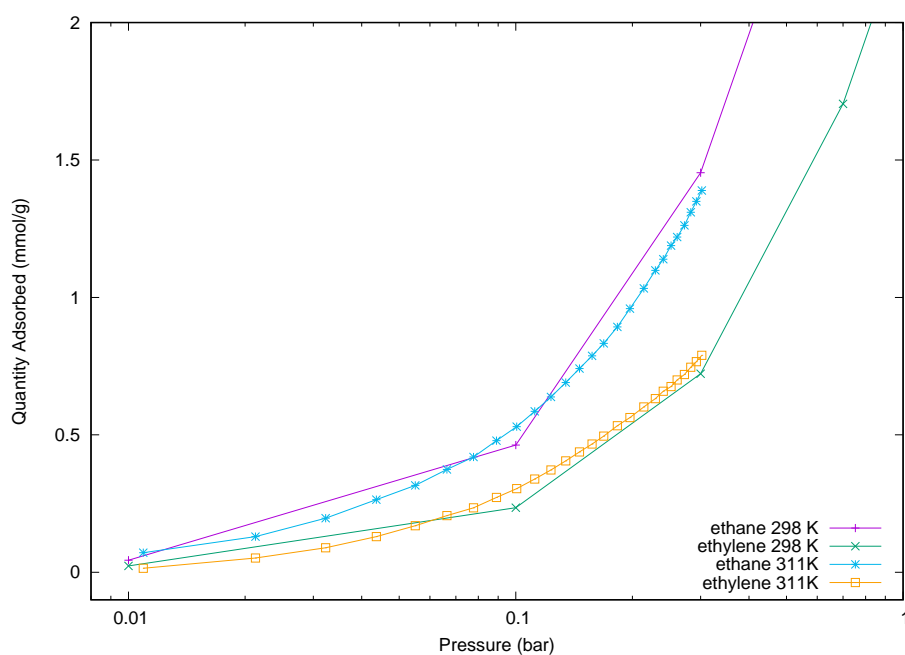


Figure S 2 Comparison between ethane and ethylene isotherms previously reported at 298 K [7] and those obtained in this work by ZLC at 311 K.

S.2 Thermodynamic properties of ethane and ethylene

Table S 1. Thermodynamic properties of ethane and ethylene.

	Ethane	Ethylene
T_{boil} [36]	184.6 ± 0.6 K	169 ± 0.6 K
T_c [07]	305.3 ± 0.3 K	282.4 ± 0.3 K
P_c [07]	49 ± 1 bar	50.6 ± 1 bar
ρ_c [07]	6.9 ± 0.4 mol/L	7.63 ± 0.4 mol/L
Δ_{vap}H° [38]	9.76 kJ/mol	13.6 kJ/mol
C_p (gas) at 298.15 K [38]	52.49 J/molK	42.9 J/molK
Vapor enthalpy [39]	15.48 kJ/mol	14.84 kJ/mol
Vapor pressure at 293.15 K [39]	48.2 kPa	53.3 kPa

References:

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